

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of claims:

Claims 1-15 (canceled)

Claim 16 (new): A cache device for storing data received through a network as cached data and for retrieving the cached data in response to a data request from a terminal to send the cached data to the terminal, the cache device comprising:

a cache group table including group configuration information regarding a cache group including the cache device and other cache devices connected to the network, collaborative content control being carried out for the cache group; and

a controller for determining which data blocks are in a deletion pending status, the data blocks being data stored in the cache device, out of data blocks including in content based on the information included in the cache group table, and for controlling the data blocks in the deletion pending status according to a deletion pending list including entries having information corresponding to the data blocks in the deletion pending status.

Claim 17 (new): A cache device as claimed in claim 16, wherein:

the cache group table includes an identifier of content that is collaboratively controlled by the cache group, a number N of cache devices of the cache group, and group member numbers m assigned to respective cache devices;

the controller determines which data blocks are in a deletion pending status, the data blocks being stored in the cache device, out of the data blocks composing the content, which is collaboratively controlled; and

the controller carries out a process based on a block offset number C serving as offset information, of a data block subjected to the determination, from a leading data block of the content to which the data block belongs:

$C \bmod N$ is calculated;

$V = N$ when $C \bmod N = 0$, and
 $V = (C \bmod N)$ when $C \bmod N \neq 0$; and
whether $V = m$ is judged, and
the respective data block is judged to be one of the data blocks in the deletion pending status when $V = m$.

Claim 18 (new): A cache device as claimed in claim 16, wherein:
the controller judges, by exchanging messages between the cache devices, whether the collaborative control by the cache group is applicable to a data block corresponding to an entry to be removed from an LRU list serving as a list for controlling data blocks stored in storage areas; and
the controller generates the cache group table upon judging that the collaborative control is applicable.

Claim 19 (new): A cache device as claimed in claim 16, wherein, for a data block corresponding to an entry to be removed from an LRU list serving as a list for controlling data blocks stored in storage areas, the controller determines which data blocks are in a deletion pending status, the data blocks being data stored in the cache device, out of the data blocks included in the content based on the information included in the cache group table, and the controller controls the data block, other than the data blocks in the deletion pending status, in a free block list serving as a list for controlling data blocks that can be deleted.

Claim 20 (new): A cache device as claimed in claim 16, wherein the deletion pending list comprises a plurality of deletion pending lists corresponding to priority, the data blocks being stored in order of the priority, and the controller judges the priority at which each of the data blocks is stored, and registers an entry corresponding to each of the data blocks in one list selected from the deletion pending lists according to the judgment.

Claim 21 (new): A cache device as claimed in claim 17, wherein when the data request from the terminal is for acquiring a data block contained in the content that is collaboratively controlled by the cache group, the controller judges which cache device of the cache group stores the requested data block and retrieves the data block from the cache device itself or other cache devices of the cache group according to the judgment.

Claim 22 (new): A cache device as claimed in claim 21, wherein the cache group table includes an identifier of the content that is collaboratively controlled by the cache group, a number N of cache devices of the cache group, and group member numbers m assigned to respective cache devices, and the controller carries out a following process based on a block offset number C serving as offset information, of the requested data block, from the leading data block of the content to which the data block belongs:

$C \bmod N$ is calculated;

$V = N$ when $C \bmod N = 0$, and

$V = (C \bmod N)$ when $C \bmod N \neq 0$; and

$V = m$, and

the data block is retrieved from a cache device having the group member number m that is calculated.

Claim 23 (new): A method for controlling cached data in a cache device for storing data received through a network as the cached data and retrieving the cached data in response to a data request from a terminal to send the cached data to the terminal, the method comprising:

determining which data blocks are in a deletion pending status, the data blocks being data stored in the cache device, out of data blocks including content based on group configuration information, stored in a cache group table, regarding a cache group including the cache device and other cache devices connected to the network, collaborative content control being carried out for the cache group; and

controlling the data blocks in the deletion pending status according to a deletion pending list including entries having information corresponding to the data blocks in the deletion pending status.

Claim 24 (new): A method for controlling cached data as claimed in claim 23, wherein:

the cache group table includes an identifier of the content that is collaboratively controlled by the cache group, a number N of cache devices of the cache group, and group member numbers m assigned to respective cache devices;

in the step of determining which data blocks are in a deletion pending status, the data blocks in the deletion pending status, the data blocks being stored in the cache device, are determined out of the data blocks including the content, which is collaboratively controlled; and

a process is carried out based on a block offset number C serving as offset information, of a data block subjected to the determination, from a leading data block of the content to which the data block belongs:

$C \bmod N$ is calculated;

$V = N$ when $C \bmod N = 0$, and

$V = (C \bmod N)$ when $C \bmod N \neq 0$; and

whether $V = m$ is judged, and

the respective data block is judged to be one of the data blocks in the deletion pending status when $V = m$.

Claim 25 (new): A method for controlling cached data as claimed in claim 23, further comprising:

judging, by exchanging messages between the cache devices, whether the collaborative control by the cache group is applicable to a data block corresponding to an entry to be removed from an LRU list serving as a list for controlling data blocks stored in storage areas; and

generating the cache group table upon judging that the collaborative control is applicable.

Claim 26 (new): A method for controlling cached data as claimed in claim 23, further comprising:

determining which data blocks are in a deletion pending status, the data blocks being data stored in the cache device, out of the data blocks included in the content based on the information included in the cache group table for a data block corresponding to an entry to be removed from an LRU list serving as a list for controlling data blocks stored in storage areas; and

controlling the data block, other than the data blocks in the deletion pending status, in a free block list serving as a list for controlling data blocks that can be deleted.

Claim 27 (new): A method for controlling cached data as claimed in claim 23, wherein the deletion pending list comprises a plurality of deletion pending lists corresponding to priority, the data blocks being stored in order of the priority and wherein the method further comprises judging the priority at which each of the data blocks is stored, and registering an entry corresponding to each of the data blocks in one list selected from the deletion pending lists according to the judgment.

Claim 28 (new): A method for controlling cached data as claimed in claim 24, further comprising:

judging which cache device of the cache group stores the requested data block; and

retrieving the data block from the cache device itself or other cache devices of the cache group according to the judgment when the data request from the terminal is for acquiring a data block contained in the content that is collaboratively controlled by the cache group.

Claim 29 (new): A method for controlling cached data as claimed in claim 28, wherein: the cache group table includes an identifier of the content that is

collaboratively controlled by the cache group, the number N of cache devices of the cache group, and group member numbers m assigned to respective cache devices; and

in the step of retrieving the data block, a process is carried out based on a block offset number C serving as offset information, of the requested data block, from the leading data block of the content to which the data block belongs:

$C \bmod N$ is calculated;

$V = N$ when $C \bmod N = 0$, and

$V = (C \bmod N)$ when $C \bmod N \neq 0$; and

$V = m$, and

the data block is retrieved from a cache device having the group member number m that is calculated.

Claim 30 (new): A computer program for controlling cached data in a cache device for storing data received through a network as the cached data and retrieving the cached data in response to a data request from a terminal to send the cached data to the terminal, the computer program comprising:

a step of determining which data blocks are in a deletion pending status, the data blocks being stored in the cache device, out of data blocks having content based on group configuration information, stored in a cache group table, regarding a cache group composed of the cache device and other cache devices connected to the network, collaborative content control being carried out for the cache group; and

a step of controlling the data blocks in the deletion pending status according to a deletion pending list including entries having information corresponding to the data blocks in the deletion pending status.